

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 March 2004 (04.03.2004)

PCT

(10) International Publication Number
WO 2004/018457 A1

- (51) International Patent Classification⁷: **C07D 401/14**, A61K 31/502, A61P 11/00 (74) Agent: **WILD, Robert**; c/o ALTANA Pharma AG, Byk-Gulden-Strasse 2, 78467 Konstanz (DE).
- (21) International Application Number: PCT/EP2003/008675 (81) Designated States (*national*): AE, AL, AU, BA, BR, CA, CN, CO, DZ, EC, GE, HR, ID, IL, IN, IS, JP, KR, LT, LV, MA, MK, MX, NO, NZ, PH, PL, SG, TN, UA, US, VN, YU, ZA, ZW.
- (22) International Filing Date: 6 August 2003 (06.08.2003)
- (25) Filing Language: English (84) Designated States (*regional*): Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).
- (26) Publication Language: English
- (30) Priority Data: 02017977.6 10 August 2002 (10.08.2002) EP
- (71) Applicant (*for all designated States except US*): **ALTANA PHARMA AG** [DE/DE]; Byk-Gulden-Str. 2, 78467 Konstanz (DE).
- (72) Inventors: **HATZELMANN, Armin**; Alter Wall 3, 78467 Konstanz (DE). **BARSIG, Johannes**; Bleichenweg 11, 78467 Konstanz (DE). **MARX, Degenhard**; Obere Reute 15, 78345 Moos (DE). **KLEY, Hans-Peter**; Im Weinberg 3b, 78476 Allensbach (DE). **CHRISTIAANS, Johannes, A. M.**; Zevenwouden 233, NL-3524 CR Utrecht (NL). **MENGE, Wiro, M. P. B.**; Pontanuslaan 11, NL-6821 HM Arnhem (NL).
- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): **STERK, Geert, Jan** [NL/NL]; Stadhouderslaan 38, NL-3583 JJ Utrecht (NL).
- Declarations under Rule 4.17:**
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AL, AU, BA, BR, CA, CN, CO, DZ, EC, GE, HR, ID, IL, IN, IS, JP, KR, LT, LV, MA, MK, MX, NO, NZ, PH, PL, SG, TN, UA, VN, YU, ZA, ZW, Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR)
 - as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
 - of inventorship (Rule 4.17(iv)) for US only
- Published:**
- with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: PYRROLIDINEDIONE SUBSTITUTED PIPERIDINE-PHTHALAZONES AS PDE4 INHIBITORS

(57) Abstract: The compounds of a certain formula (1), in which the given substituents have the meanings as indicated in the description, are novel effective PDE4 inhibitors.

WO 2004/018457 A1